

## REMARKS

Claims 14-26 were pending in the present Application. Claims 14, 19, 24, and 25 have been amended, Claim 16 has been cancelled, and Claims 32-33 newly added, leaving Claims 14-15, 17-26, and 32-33 for consideration in the present amendment.

Support for the amendment to Claims 14 and 19 can be found at least in paragraphs [0038], [0039], [0041], and Figure 9. Claims 24 and 25 have been amended merely to fix an inadvertent error. Antecedent support for new Claims 32, 33 can be found at least in paragraph [0041]. No new matter has been introduced by way of the amendments.

Reconsideration and allowance of the claims are respectfully requested in view of the following remarks.

### Claim Rejections under 35 USC §112

A. Claims 24 and 25 stand rejected under 35 USC §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The rejection has been rendered moot in view of the amendments to Claims 24 and 25. Accordingly, the rejection is respectfully requested to be withdrawn.

### Claim Rejections Under 35 U.S.C. § 102(b)

A. Claims 14, 15, 17, and 18 stand rejected under 35 U.S.C. § 102(b), as allegedly anticipated by Gaisford (US 5,103,181). Applicants respectfully traverse this rejection.

To anticipate a claim, a reference must disclose each and every element of the claim. *Lewmar Marine v. Varient Inc.*, 3 U.S.P.Q.2d 1766 (Fed. Cir. 1987).

Claim 14 is directed to a material detection system, comprising a plasma processing chamber; a flow path in fluid communication with the processing chamber, the flow path configured to contain a medium of interest transported to and from the plasma processing

chamber, wherein the medium of interest contains a solid material to be detected; an electromagnetic energy source downstream from the plasma processing chamber coupled to the flow path for exciting said medium of interest so as to vaporize the solid material contained therein; and an impedance measuring device for measuring an impedance value of an electromagnetic circuit, said electromagnetic circuit including said flow path therein, wherein said impedance value corresponds to an amount of solid material within said medium of interest.

Gaisford fails to disclose each and every element. For example, Gaisford fails to disclose a material detection system including an electromagnetic energy source downstream from a plasma processing chamber. Rather, Gaisford merely discloses a funnel-like apparatus for what appears to gravity feed a fluid of interest into a conduit. There is no plasma processing chamber disclosed in Gaisford's system.

Moreover, Gaisford fails to disclose a material detection system comprising an electromagnetic energy source coupled to the flow path for exciting said medium of interest *so as to vaporize the solid material contained therein*. Rather, Gaisford discloses a method and apparatus for determining the composition, homogeneity, and/or flow rate of a material. (see Gaisford, Col. 13, ll. 4-9). Gaisford directly monitors the electrical impedance properties of the fluid to determine the fractional compositional make-up. (see Gaisford Col. 1, ll. 10-15). There is no disclosure that its apparatus is configured to vaporize solid material contained therein. Instead, Gaisford's apparatus monitors the composition of a multi-component fluid flowing in a pipe *without significantly interfering with the fluid flow*. (see Gaisford, Col. 6, ll. 50-54) This is not the same as Applicants' claimed system wherein said electromagnetic energy source is coupled to the flow path for exciting the medium of interest in order to vaporize the solid material contained therein.

For at least these reasons, Gaisford fails to provide disclosure of the claimed material detection system. Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejection applied to independent Claim 14. Given that Claims 15, 17, and 18 depend from, and include all the limitations of, their respective base claim, they too are patentable.

Claim Rejections Under 35 U.S.C. § 103(a)

A. Claim 16 stands rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Gaisford (as applied above), and further in view of Quon (US 2004/0135590A1). Applicants respectfully traverse this rejection.

Claim 16 has been canceled and as such, the rejection is moot. With regard to Quon, the Examiner is correct that plasma is often used for fabrication of substrates. However, here the Applicants are interested in the effluent from a plasma processing chamber, which is not related to fabrication of substrates. Rather, Applicants system addresses fouling in areas downstream from the plasma process chamber, such as in the throttle valve and exhaust lines (see paragraph [0007]).

B. Claims 19, 20, and 22-26 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Beaudry (US 3,569,777) in view of Gaisford. Applicants respectfully traverse this rejection.

Gaisford is discussed above.

Beaudry is generally directed to plasma-generating machines and an impedance converter for connecting the radio frequency output of the generator to the plasma-producing electrodes.

For an obviousness rejection to be proper, the Examiner must meet the burden of establishing that all elements of the invention are disclosed in the prior art; that the prior art relied upon, or knowledge generally available in the art at the time of the invention, must provide some suggestion or incentive that would have motivated the skilled artisan to modify a reference or combined references. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988). “A patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” *KSR Int’l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1741 (2007). To find obviousness, the Examiner must “identify a reason that would have prompted a person of ordinary skill in the art in the relevant field to combine the elements in the way the claimed new invention does.” *Id*

Beaudry fails to teach or suggest a plasma based semiconductor material removal system that includes, *inter alia*, an electromagnetic energy source coupled to an effluent carrying conduit downstream from a plasma processing chamber, wherein the electromagnetic energy source is configured to cause excitation of a gas having reactive species therein, wherein the excited gas may include a solid material, and wherein the excitation is effective to vaporize the solid material. Rather, Beaudry discloses an electromagnetic source for generating plasma within a reaction chamber for interacting with a workpiece substrate. The impedance detector as disclosed in Beaudry is used to monitor the impedance of the plasma within the processing chamber, which will automatically provides substantial impedance matching between the generator and capacitive electrodes of the gaseous process chamber and throughout a range of changing parameters required to carry out plasma processing. Nowhere is it disclosed or suggested that Beaudry include an electromagnetic energy source that is coupled to the effluent carrying conduit downstream from a plasma processing chamber. Moreover, there is no disclosure or suggestion that the electromagnetic energy source is configured to cause excitation of a gas having reactive species within the effluent carrying conduit, wherein the excited gas may include a solid material, and wherein the excitation is effective to vaporize the solid material. This is markedly different from Applicants' claimed system.

Gaisford, also, fails to disclose or suggest at least these features, and thus, fails to compensate for the deficiencies of Beaudry

In view of the forgoing, the rejection is requested to be withdrawn.

C. Claims 21 stands rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Beaudry and Gaisford as applied to Claim 19 above, and further in view of Mills (2004/0018348A1). Applicants respectfully traverse this rejection.

Claim 21 is dependent upon Claim 19 and as such is directed to a plasma based semiconductor material removal system comprising, *inter alia*, an electromagnetic energy source coupled to an effluent carrying conduit downstream from a plasma processing chamber, wherein the electromagnetic energy source is configured to cause excitation of a gas having reactive

species therein, wherein the excited gas may include a solid material, and wherein the excitation is effective to vaporize the solid material.

Beaudry and Gaisford are discussed above and fail to disclose or suggest at least these features.

Mills is directed to a microwave power cell for the catalysis of atomic hydrogen to form novel hydrogen species and/or compositions of matter comprising new forms of hydrogen. It is unclear as to the relevance of Mills since this reference merely discloses a microwave power cell for catalysis of atomic hydrogen. There is no teaching or suggestion of an electromagnetic energy source coupled to an effluent carrying conduit downstream from a plasma processing chamber, wherein the electromagnetic energy source is configured to cause excitation of a gas having reactive species therein, wherein the excited gas may include a solid material, and wherein the excitation is effective to vaporize the solid material. Like Beaudry and/or Gaisford, there is no disclosure or suggestion of an electromagnetic source downstream from a plasma processing chamber.

In view of the foregoing, a *prima facie* case of obviousness has not been established and the rejection is requested to be withdrawn.

It is believed that the foregoing remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and allowance are requested.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 06-1130.

Respectfully submitted,

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